

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

In re Patent Application of

Atty Dkt. 2920-425

C# M#

Mark Peyser FRIEDLANDER, III

TC/A.U.: 3741

Serial No. 10/042,391

Examiner: Lulit Semunegus

Filed: January 11, 2002

Date: August 5, 2004

Title: APPARATUS AND METHOD FOR PASSIVE VENTING OF ROCKET MOTOR OR  
ORDNANCE CASE**Mail Stop Appeal Brief - Patents**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

☐ **Correspondence Address Indication Form Attached.**☐ **NOTICE OF APPEAL**

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner twice/finally rejecting (\$330.00) applicant's claim(s).

\$

☒ An appeal **BRIEF** is attached in triplicate in the pending appeal of the above-identified application (\$ 330.00)

\$ 330.00

☐ Credit for fees paid in prior appeal without decision on merits

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☐ A reply brief is attached in triplicate under Rule 193(b)

(no fee)

☐ Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s) (\$110.00/1 month; \$420.00/2 months; \$950.00/3 months; \$1480.00/4 months)

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**SUBTOTAL** \$ 330.00☐ Applicant claims "Small entity" status, enter 1/2 of subtotal and subtract

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☐ "Small entity" statement attached.**SUBTOTAL** \$ 330.00

Less month extension previously paid on

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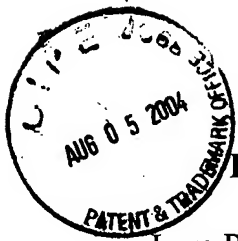
**TOTAL FEE ENCLOSED** \$ 330.00

Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140**. A duplicate copy of this sheet is attached.

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**APPEAL BRIEF**

Sir:

This is an appeal brief filed pursuant to 35 U.S.C. §134 from the Examiner's final rejection of claims 1-17, which constitute all of the claims remaining in the above-identified application. An oral hearing has not yet been requested, but it is likely that Appellant will request an oral hearing upon receipt of the Examiner's Answer.

**I. REAL PARTY IN INTEREST**

By virtue of the Assignment recorded at Reel 14699, Frames 111-118 of the U.S. Patent and Trademark Office records, the real party in interest of the application which is the subject of the instant appeal is Aerojet-General Corporation, an Ohio corporation, having offices at 5945 Wellington Road, Gainesville, VA 20155-1699.

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## **II. RELATED APPEALS AND INTERFERENCES**

There are no other appeals or interferences known to the Appellant, Appellant's representative or assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the instant appeal.

## **III. STATUS OF CLAIMS**

Claims 1-17 are presently pending in the instant application and are the claims on appeal.

Claims 1-16 stand finally rejected by the Examiner for the reasons enumerated hereinafter.

Claims 1, 2, 4 and 14-16 stand finally rejected under 35 U.S.C. 102(e) as being anticipated by Vetter et al. (U.S. Patent No. 4,458,482).

Claims 3, 5-9 and 13-15 stand finally rejected under 35 U.S.C. 103(a) as being unpatentable over Vetter et al. (U.S. Patent No. 4,458,482) in view of Vetter et al. (U.S. Patent No. 4,478,151).

Claims 10, 11 and 12 stand finally rejected under 35 U.S.C. 103(a) as being unpatentable over Vetter et al. (U.S. Patent No. 4,458,482) in view of Henderson et al. (U.S. Statutory Invention Registration No. H1047).

The Examiner has not acted on Claim 17 in the final rejection.

## **IV. STATUS OF AMENDMENTS**

No amendments to the claims were filed after the final rejection by the Examiner.

## **V. SUMMARY OF INVENTION**

The present invention is directed to a new and improved passive venting apparatus and method utilizing one or more combustible strips formed of a non-explosive and non-

pyrotechnic material applied to or formed as a part of the exterior of a rocket motor or ordnance case and constructed to burn and provide sufficiently high heat input into the adjacent portion or portions of the case to weaken it and aid in the passive venting of the case when exposed to a severe thermal threat. The strip or strips may be formed of any suitable, combustible metallic or non-metallic material such as magnesium or a magnesium alloy, mixtures of metal powders such as iron or aluminum or a palladium-aluminum alloy. The strip or strips may be of any suitable size, configuration or number, and may be positioned on the case in any suitable or desired orientation.

In one embodiment, a single strip of a suitable length and thickness may be used. In a second embodiment, a number of strips may be spaced about the case, and in a further embodiment, the strip may be in the form of one or more rings surrounding or partially surrounding the case. The strip or strips may be secured to the case in any suitable or desired manner, or may be part of the external structure of the case. Depending on the material of the case, the strip could be formed of other suitable heat-generating metallic or organic materials.

As shown in Figs. 1 and 2, a single strip 18 may be used and may be of any suitable length, width, thickness and configuration, depending on the size, thickness and configuration of the rocket motor or ordnance case 12. The strip 18 may be secured to the case 12 in any suitable manner, such as by clamps, screws, clips, rivets or the like. It is necessary that the securing means be constructed to hold the strip 18 in contact with or close to the adjacent portions of the case 12 during its exposure to an external fire or the like. The strip 18 may also be formed as part of the external structure of the case 12.

Fig. 3 illustrates a second embodiment of the invention wherein a plurality of small strip sections 118 are secured to the case 112 in circumferentially, longitudinally or other spaced relation. The number, size and configuration of the strip sections 118 are determined by the size and material of the case 112 such that the strip sections generate sufficient heat to weaken the adjacent portions of the case to effect rupture and venting thereof in the event of a surrounding or external fire or the like.

Fig. 4 illustrates a third embodiment of the present invention wherein the strip is in the form of one or more rings 218 closely surrounding the case 212. Again, the size and material of the ring or rings 218 will be determined by the size and material of the case 212.

The passive venting apparatus and method of the present invention are simple, inexpensive to produce, assemble and use, and effective in operation, as compared with the prior art devices and methods for effecting the venting of rocket motor or ordnance cases to prevent cook-off when exposed to an external fire or the like.

## **VI. ISSUES**

The issues presented in this appeal are as follows:

(A) Whether the Examiner has failed to establish anticipation of claims 1, 2, 4 and 14-16 in rejecting these claims under 35 U.S.C. 102(e) based on Vetter et al. (U.S. Patent No. 4,458,482);

B) Whether the Examiner has failed to establish a *prima facie* case of obviousness for claims 3, 5-9 and 13-15 in rejecting these claims under 35 U.S.C. 103(a) based on Vetter et al. (U.S. Patent No. 4,458,482) in view of Vetter et al. (U.S. Patent No. 4,478,151); and

(C) Whether the Examiner has failed to establish a *prima facie* case of obviousness for claims 10, 11 and 12 in rejecting these claims under 35 U.S.C. 103(a) based on Vetter et al. (U.S. Patent No. 4,458,482) in view of Henderson (U.S. Statutory Invention Registration No. H1047).

## **VII. GROUPING OF CLAIMS**

Independent claims 1 and 14 stand or fall together. Claim 2 stands or falls alone. Dependent claims 3 and 17 stand or fall together. Dependent claims 4-7 and 15 stand or fall together. Dependent claims 8 and 9 stand or fall together. Dependent claims 10 and 11 stand or fall together. Dependent claim 12 stands or falls alone. Dependent claim 13 stands or falls alone. Dependent claim 16 stands or falls alone.

The claims of each group identified above recite different features which are believed to be separately patentable as discussed hereinafter.

## **VIII. ARGUMENT**

**THE EXAMINER HAS FAILED TO ESTABLISH ANTICIPATION OR A *PRIMA FACIE* CASE OF OBVIOUSNESS FOR ANY OF THE PENDING CLAIMS.**

The Supreme Court, in the case of Graham v. John Deere, 383 U.S. 1, 148 USPQ 459 (1966) set forth the necessary factual inquiries to be made in determining the obviousness or non-obviousness of claims at issue, as follows:

[U]nder §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are ascertained; and the level of ordinary skill in the art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined.

Id. at 17, 148 USPQ at 467.

It is well established that the Examiner has the burden, under §103, of establishing anticipation or a *prima facie* case of obviousness. In re Piasecki, 223 USPQ 785 (Fed. Cir. 1984). In the instant case, the Examiner has misconstrued the teachings of the cited references and, thus, has erred in determining the content of the prior art. As a result, the Examiner has also erred in ascertaining the differences between the teachings of the prior art and the invention defined by the claims at issue. Moreover, the Examiner has failed to cite any objective teachings in the prior art, or to show knowledge commonly available in the art, which overcome the deficiencies of the cited references. Further, the Examiner's rejection is based on improper hindsight reconstruction, in that the rejection relies on knowledge gleaned only from Applicant's disclosure and not on knowledge that was within the level of ordinary skill in the art at the time the invention was made. Thus, the Examiner has failed to meet his burden under Section 102 of establishing anticipation or under Section 103 of establishing a *prima facie* case of obviousness.

**1. Claims 1, 2, 4 and 14-16 are not anticipated by Vetter '482.**

The rejection of claims 1, 2, 4 and 14-16 under 35 U.S.C. 102(e) is based solely on the disclosure of Vetter et al., U.S. Patent No. 4,458,482 (hereafter "Vetter '482"). As explained hereinafter, Vetter '482 clearly fails to anticipate the novel recitations in independent apparatus claim 1 and dependent claims 2 and 4, and independent method claim 14 and dependent claims 15 and 16.

Claim 1 and dependent claims 2 and 4 all call for the improvement in a rocket motor or ordnance device containing propellant or explosive material enclosed in a case,

which presents an explosion hazard when subjected to external heat, comprising an exposed combustible strip formed of a non-explosive and non-pyrotechnic material secured to or formed as part of the exterior surface of the case, the strip being constructed to burn and generate sufficient heat to weaken the adjacent portion of the case and effect rupture of the case to vent interior gases therein prior to autoignition of the propellant or explosive.

Dependent claim 2 calls for the strip as being in contact with the exterior surface of the case, and dependent claim 4 calls for the strip as extending partially around the exterior surface of the case.

Similarly, method claim 14 and dependent claims 15 and 16 call for a method of venting a rocket motor or ordnance device case containing propellant or explosive material which presents an explosive hazard when subjected to external heat, comprising providing an exposed combustible strip on the exterior surface of the case, the strip being formed of a non-explosive and non-pyrotechnic material constructed to burn and generate sufficient heat when exposed to predetermined external heat to weaken the adjacent portion of the case and effect rupture of the case to vent interior gases prior to autoignition of the propellant or explosive.

Dependent claim 15 calls for a plurality of combustible strips being provided on the exterior surface of the case in spaced relation thereon, and dependent claim 16 calls for the strip as being formed of a material that generates heat when combusted at a rate faster than the material of the case.

The novel apparatus and method recited in claims 1, 2, 4 and 14-16 clearly are not anticipated by the teachings of Vetter '482. This reference discloses the provision of a



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bare patch 15, 15' or 15" in an insulating coating 14 on the outside of a rocket motor casing 13, the bare patch having a shape to intensify heat produced stress in a predetermined area of the casing to cause failure of the casing at the predetermined area as a cook-off safety feature in the event of an external fire.

There is no teaching whatsoever in Vetter '482 of Applicant's novel feature of an exposed combustible strip formed of a non-explosive and non-pyrotechnic material secured to or formed as part of the exterior surface of the case, the strip being constructed to burn and generate sufficient heat when exposed to predetermined external heat to weaken the adjacent portion of the case and effect rupture thereof to vent interior gases therein prior to autoignition of the propellant or explosive, as specifically recited in claims 1, 2, 4 and 14-16. In the final rejection, the Examiner alleges that Vetter '482 discloses "an exposed combustible strip (15) formed of a non-explosive and non-pyrotechnic material formed as part of the exterior surface of the casing (Fig. 4 or 5)". It is noted, however, that the area 15, 15' or 15" in Vetter '482 is not an exposed combustible strip, but instead is a bare patch in an insulating coating 14 on the outside of the rocket motor casing 13. Accordingly, there is clearly no teaching in Vetter '482 that would anticipate or even render obvious the novel recitations in claims 1, 2, 4 and 14-16.

**2. Claims 3, 5-9 and 13-15 are not rendered obvious by Vetter '482 and Vetter'151.**

The rejection of claims 3, 5-9 and 13-15 under 35 U.S.C. 103(a) is based on the combined disclosures of Vetter '482 and Vetter et al., U.S. Patent No. 4,478,151

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(hereafter "Vetter '151"). The combined teachings of these references fail to render obvious or even suggest the novel recitations in claims 3, 5-9 and 13-15.

Claims 3, 5-9 and 13 are all dependent directly or ultimately on apparatus claim 1, and claim 15 is dependent on independent method claim 14. Accordingly, claims 3, 5-9 and 13-15 are all directed to an apparatus or method in which an exposed combustible strip formed of non-explosive and non-pyrotechnic material is secured to or formed as part of the exterior surface of a rocket motor or ordnance device case to burn and generate sufficient heat when exposed to predetermined external heat to weaken the adjacent portion of the case and effect rupture thereof to vent interior gases therein prior to autoignition of the propellant or explosive enclosed in the case. For the reasons set forth herein with respect to the rejection of claims 1, 2, 4 and 14-16, it is submitted that Vetter '482 clearly fails to anticipate or render obvious the novel apparatus or method recited in claims 3, 5-9 and 13-15.

The teachings of Vetter '151 fail to supply the deficiencies of the teachings of Vetter '482 with respect to the novel recitations in these apparatus and method claims. This reference discloses the positive venting or weakening of a pressure hull in the event of an external fuel fire such that, when the propellant grain of the ordnance ignites, the grain vents harmlessly through the weakened or open wall of the pressure hull. This is accomplished by placing a small charge of thermite or thermite-like material at predetermined locations on the interior of the pressure hull. An igniter is intimately associated with these thermite charges and the entire assembly is covered with an insulator of the type conventionally used as a rocket motor liner. This construction is

completely different from Applicant's claimed construction and method wherein an exposed combustible strip is secured to or formed as part of the exterior surface of the case, the strip being constructed to burn and generate sufficient heat when exposed to predetermined external heat to weaken the adjacent portion of the case and effect rupture thereof to vent interior gases prior to autoignition of the propellant or explosive.

The Examiner states that Vetter '151 teaches a plurality of strips which are in circumferentially and longitudinally spaced relation to the exterior surface of the case and are in the form of rings mounted in spaced relation on the exterior surface of the case (Fig. 5). It is noted, however, that Fig. 5 of Vetter '151 merely discloses the placement of igniters 21 on the exterior of a thermite mass 15' that is positioned on the interior of the pressure hull. Attention is directed to column 4, lines 16-20 of this reference wherein it is clearly stated as follows:

"Referring to Fig. 6, a perspective view of another embodiment of the invention is illustrated. In this embodiment, strips of thermite material indicated at 30 are placed on inner surface 14 of hull 11 in a manner similar to the placement of pellets 13 and 13' in Fig. 1."

It is apparent, therefore, that Vetter '151 does not disclose or even suggest Applicant's novel feature of an exposed combustible strip secured to or formed as part of the exterior surface of the case to burn and vent the case when exposed to predetermined external heat, as recited in claims 3, 5-9 and 13-15. Applicant's novel construction and method are significantly different and far simpler in construction and operation from the pressure hull penetrator of Vetter '151.

Also, the combined teachings of Vetter '482 and Vetter '151 fail to render obvious or even suggest the teachings of dependent claims 3, 5-9, 13 and 15.

**3. Claims 10, 11 and 12 are not rendered obvious by Vetter '482 and Henderson H1047.**

The rejection of claims 10, 11 and 12 under 35 U.S.C. 103(a) is based on the disclosures of Vetter '482 and Henderson (H1047). It is submitted that the combined disclosures of Vetter '482 and Henderson fail to render obvious or even suggest the novel recitations in dependent claims 10-12.

Claims 10-12 are all dependent directly or ultimately on claim 1 and thus clearly distinguish over the teachings of Vetter '482 for the reasons set forth herein with respect to the rejection of claim 1. Claims 10-12 all include the limitation of an exposed combustible strip formed of a non-explosive and non-pyrotechnic material secured to or formed as part of the exterior surface of the rocket motor or ordnance device case. This novel feature is completely missing from the teachings of Vetter '482.

The Examiner has cited a secondary reference to Henderson because of its teaching of a strip 10 formed of metal or magnesium. Other than the teaching of the use of metal or magnesium for a warhead component, Henderson fails to supply the deficiencies of Vetter '482 with respect to the novel limitations in dependent claims 10-12. Accordingly, claims 10-12 are not rendered obvious or even suggested by the combined teachings of the cited references.

Based on the lack of any teaching in the cited prior art of the above-noted distinguishing features of the claimed invention, it is plainly evident that one of ordinary

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skill in the art would not have been concerned with, and would not have recognized the advantages of providing the particular claimed combination of elements at the time the invention was made. As explained in detail herein, the Examiner has failed to provide any objective evidence or sound reasoning as to why the differences between the claimed invention and the cited prior art would have been obvious to a person of ordinary skill in the art.

It is respectfully submitted that the burden imposed on the Examiner under 35 U.S.C. §103 requires sound evidence or logical reasoning to be presented as to the objective teachings or suggestions in the prior art. In this case, the Examiner has clearly failed to meet this burden to establish a *prima facie* case of obviousness. The rejection is clearly based on improper hindsight reconstruction using the teachings contained in the instant application. Thus, Applicant respectfully submits that the rejection of the claims based on the cited references is untenable.

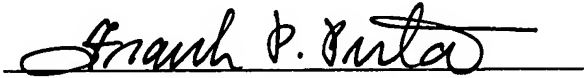
Before the Examiner may combine the disclosures of the cited references in order to establish a *prima facie* case of obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Jones, 958 F.2d 347 (Fed. Cir. 1992). Even assuming, *arguendo*, that a given combination of references is proper, the combination thereof must, in any event, disclose, teach or suggest the features of the claimed invention in order to establish a *prima facie* case of obviousness. In this case, the Examiner has failed to meet this burden.

**VIII. CONCLUSION**

For the reasons set forth above, it is respectfully submitted that all pending claims 1-17 clearly and patentably distinguish over the prior art of record and are in condition for allowance. The Examiner has clearly failed to sustain his burden of establishing anticipation or a *prima facie* case of obviousness for any of the claims on appeal. Accordingly, the Board is respectfully requested to reverse all outstanding rejections and pass all pending claims to issuance.

Respectfully submitted,

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**APPENDIX**  
**CLAIMS ON APPEAL**

1. In a rocket motor or ordnance device containing propellant or explosive material enclosed in a case, which presents an explosion hazard when subjected to external heat, the improvement comprising:

an exposed combustible strip formed of a non-explosive and non-pyrotechnic material secured to or formed as a part of the exterior surface of the case;  
said strip being constructed to burn and generate sufficient heat when exposed to predetermined external heat to weaken the adjacent portion of the case and effect rupture of the case to vent interior gases therein prior to autoignition of the propellant or explosive.

2. The rocket motor or ordnance device of Claim 1 wherein said strip is in contact with the exterior surface of the case.

3. The rocket motor or ordnance device of Claim 1 wherein said strip is formed of a metallic material.

4. The rocket motor or ordnance device of Claim 1 wherein said strip extends partially around the exterior surface of the case.

5. The rocket motor or ordnance device of Claim 1 wherein a plurality of metallic strips are secured to the exterior surface of the case in spaced relation thereon.

6. The rocket motor or ordnance device of Claim 5 wherein said strips are in circumferentially spaced relation on the exterior surface of the case.

7. The rocket motor or ordnance device of Claim 5 wherein said strips are in longitudinally spaced relation on the exterior surface of the case.

8. The rocket motor or ordnance device of Claim 1 wherein said strip is in the form of a ring extending completely around the exterior surface of the case.

9. The rocket motor or ordnance device of Claim 8 wherein a plurality of metallic strips in the form of rings are mounted in spaced relation on the exterior surface of the case.

10. The rocket motor or ordnance device of Claim 1 wherein the case is formed of metal and said strip is formed of magnesium.

11. The rocket motor or ordnance device of Claim 10 wherein said strip is formed of a magnesium alloy.

12. The rocket motor or ordnance device of Claim 1 wherein the case is formed of metal and said strip is formed of an iron and aluminum powder mixture.

13. The rocket motor or ordnance device of Claim 1 wherein the case is formed of metal and said strip is formed of a palladium-aluminum alloy.

14. A method of venting a rocket motor or ordnance device case containing propellant or explosive material which presents an explosive hazard when subjected to external heat, comprising the step of providing an exposed combustible strip on the exterior surface of the case;

said strip being formed of a non-explosive and non-pyrotechnic material constructed to burn and generate sufficient heat when exposed to predetermined external heat to weaken the adjacent portion of the case and effect rupture of the case to vent interior gases therein prior to autoignition of the propellant or explosive.

15. The method of Claim 14 wherein a plurality of combustible strips are provided on the exterior surface of the case in spaced relation thereon.

16. The rocket motor or ordnance device of claim 1 wherein said strip is formed of a material that generates heat when combusted at a rate faster than the material of the case.

17. The rocket motor or ordnance device of claim 16 wherein said strip is formed of a metal or metal ore.